

ABSTRACT OF THE DISCLOSURE

Disclosed herein is an insulating nitride layer suitable for group III-V nitride semiconductor devices. It has a high resistance and good insulating properties and hence it electrically isolates elements, without the active layer decreasing in conductivity. Disclosed also herein is a process for forming said nitride layer and a semiconductor device having said nitride layer for improved characteristic properties. The semiconductor device is an AlGa_N/Ga_N HEMT or the like which has a Ga_N active layer and an insulating nitride layer formed thereon from a group III-V nitride compound semiconductor heavily doped mostly with a group IIB element (particularly Zn) in an amount not less than $1 \times 10^{17}/\text{cm}^3$.